UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/620,807	07/17/2003	Yusuke Tsutsui	492322013300	8454

25227 7590 05/16/2006

MORRISON & FOERSTER LLP
1650 TYSONS BOULEVARD
SUITE 300
MCLEAN, VA 22102

EXAMINER	
SHERMAN, STEPHEN G	

ART UNIT	PAPER NUMBER
2629	

DATE MAILED: 05/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/620,807	TSUTSUI ET AL.	
	Examiner	Art Unit	
	Stephen G. Sherman	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 December 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the amendment filed the 24 April 2006. Claims 1-7 are pending.

Response to Arguments

2. Applicant's arguments with respect to claims 1-7 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1-2 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al. (US 6,552,702) in view of Yamakawa (US 6,654,028).

Regarding claim 1, Abe et al. disclose a display device displaying a color image made of a plurality of color components, comprising:

a plurality of pixels for each of the color components (Figure 8, pixels R11,R21,G12,G22,B13,B23, etc.); and

a γ-correction voltage switching circuit for sequentially outputting generated γ-correction voltages for each of the color components (Figure 8 and column 13, line 63 to column 14, line20 explain that the data rearrangement unit 3 turns parallel RGB data into sequentially output signals corresponding to the order of the pixels. This sequential signal is then input into the luminance data converter, which performs gamma correction and then outputs the signals as signals S3 in the same sequence meaning that the output from the luminance data converter are sequential.),

wherein the pixels are configured to sequentially receive γ-corrected display signals for each of the color components for displaying the color image (Figure 8 and column 14, lines 14-20 explain that the shift register sequential shifts the input data, then column 17, line 56 to column 18, line 15 explain that the D/A converters receive the sequentially shifted input data in order to output the corresponding values to each of the color components, meaning that the pixels sequentially receive the display signals.).

Abe et al. fail to teach that the γ-correction voltage switching circuit sequentially outputs *independently* generated γ-correction voltages for each of the color components.

Yamakawa discloses of independently generating γ-correction voltages for each of the color components (Figure 12 shows Dynamic Gamma Ckt 5R, 5G and 5B each of which generates gamma correction voltages independently for each of the color components.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to generate gamma correction independently for each color component as taught by Yamakawa in the display taught by Abe et al. such that the luminance data converter could provide separate gamma correction for each color in order to provide a linear relationship between the pixel signal and the pixel luminescence no matter what color a pixel displays thus improving display quality.

Regarding claim 2, Abe et al. disclose a display device displaying a color image made of a plurality of color components, comprising:

a plurality of pixels for each of the color components (Figure 8, pixels R11,R21,G12,G22,B13,B23, etc.);

a plurality of DA converters, each of the DA converters outputting a voltage to a predetermined number of the pixels (Figure 8, D/A converters 7e outputs a voltage to R1,1-R240,1.); and

a γ-correction voltage switching circuit for sequentially correcting the voltages outputted to the pixels for each of the color components (Figure 8 and column 13, line 63 to column 14, line20 explain that the data rearrangement unit 3 turns parallel RGB data into sequentially output signals corresponding to the order of the pixels. This sequential signal is then input into the luminance data converter, which performs gamma correction, meaning that the luminance data converter sequentially corrects the data.); and

a switching circuit provided for each set of the predetermined number of the pixels, the switching circuit receiving the voltage corrected by the γ-correction voltage switching circuit and outputted by the corresponding DA converter and sequentially supplying the γ-corrected voltage to one of the set of the predetermined number of the pixels for each of the color components (Figure 8 shows switches 7d, which correspond to the set R1,1-R240,1. The switches 7d receive the voltage corrected by the luminance data converter and outputted by the D/A, then the voltage is supplied to the set R1,1-R2240,1 sequentially since each of the columns receives a sequential signals as explained above.).

Abe et al. fail to teach that the γ-correction voltage switching circuit sequentially corrects the voltages outputted to the pixels independently for each of the color components.

Yamakawa discloses of independently generating γ-correction voltages for each of the color components (Figure 12 shows Dynamic Gamma Ckt 5R, 5G and 5B each of

which generates gamma correction voltages independently for each of the color components.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to generate gamma correction independently for each color component as taught by Yamakawa in the display taught by Abe et al. such that the luminance data converter could provide separate gamma correction for each color in order to provide a linear relationship between the pixel signal and the pixel luminescence no matter what color a pixel displays thus improving display quality.

Regarding claim 7, this claim is rejected under the same rationale as claim 1.

5. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al. (US 6,552,702) in view of Yamakawa (US 6,654,028) and further in view of APA (Figures 6-8 and page 1, line 10 to page 2, line 29 of the specification).

Regarding claim 3, Abe et al. and Yamakawa disclose the display device of claim 2.

Abe et al. and Yamakawa fail to teach wherein the DA converter outputting the voltage as a voltage divided by a resistance string between a first reference voltage and a second reference voltage and the γ-correction voltage switching circuit modifies the first and second reference voltages

APA discloses wherein the DA converter outputting the voltage as a voltage divided by a resistance string (Figure 7, the resisters between Vref(B)) and Vref(W) between a first reference voltage (Figure 7, Vref(B)) and a second reference voltage (Figure 7, Vref(W)) and the γ-correction voltage switching circuit modifies the first and second reference voltages (Page 2, lines 8-13).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the DA converter outputting the voltage as taught by the APA to replace the D/A converter in the display device as taught by the combination of Abe et al. and Yamakawa in order to create a display device which can receive positive and negative polarity signals of the different voltages.

Regarding claim 4, Abe et al. and Yamakawa disclose the display device of claim 2.

Abe et al. also disclose the display device further comprising a register storing display signals corresponding to the color components and outputting the display signals in a time sequence corresponding to the time sequence of the switching circuit (Figure 8 shows the shift register 5a which stores the display signals and outputs the signals in a time sequence corresponding to switches 7d as explained in column 14, lines 14-31 and column 17, lines 36-64.).

Abe et al. and Yamakawa fail to teach of the display device further comprising a register provided for each set of the predetermined number of the pixels.

APA also discloses of the display device further comprising a register provided for each set of the predetermined number of the pixels (Figure 6, items 23-1).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the registers taught by the APA with the display device taught by the combination of Abe et al. and Yamakawa in order to allow for the storage of the RGB display data.

6. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al. (US 6,552,702) in view of Yamakawa (US 6,654,028) and further in view of APA and Hong (US 2003/0006952).

Regarding claim 5, Abe et al., Yamakawa and APA disclose the display device of claim 3.

APA also discloses the display device wherein the first reference voltage comprises the output voltage of the switching element (Figure 7, Vref(B)).

Abe et al., Yamakawa and APA fail to teach of the display device wherein the γ-correction voltage switching circuit comprises a black reference voltage generating circuit outputting three different black reference voltages and a switching element outputting one of the three black reference voltages in response to a selection signal.

Hong discloses the display device wherein the γ-correction voltage switching circuit comprises a black reference voltage generating circuit outputting three different black reference voltages and a switching element outputting one of the three black

reference voltages in response to a selection signal (Paragraph [0038], 2nd sentence and paragraph [0047], 4th sentence. The examiner interprets that since Hong teaches of switching between a black gamma circuit that when combined with the teaching of Zavracky et al., Bitzakidis and APA, the black gamma circuit would contain three different black reference voltages, one for each color, and would selectively switch between them based on the timing and selection signal.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the black reference voltage generating circuit as taught by Hong with the display device taught by the combination of Abe et al., Yamakawa and APA in order to create a display driving apparatus and a method thereof for a wide viewing angle capable of improving the viewing angle by materializing Halftone Grayscale method by means of time division.

Regarding claim 6, Abe et al., Yamakawa and APA disclose the display device of claim 3.

APA also discloses the display device wherein the second reference voltage comprises the output voltage of the switching element (Figure 7, Vref(W)).

Abe et al., Yamakawa and APA fail to teach of the display device wherein the γ-correction voltage switching circuit comprises a white reference voltage generating circuit outputting three different white reference voltages and a switching element outputting one of the three white reference voltages in response to a selection signal.

Hong discloses the display device wherein the γ-correction voltage switching circuit comprises a white reference voltage generating circuit outputting three different white reference voltages and a switching element outputting one of the three white reference voltages in response to a selection signal (Paragraph [0038], 2nd sentence and paragraph [0047], 4th sentence. The examiner interprets that since Hong teaches of switching between a white gamma circuit that when combined with the teaching of Zavracky et al., Bitzakidis and APA, the white gamma circuit would contain three different white reference voltages, one for each color, and would selectively switch between them based on the timing and selection signal.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the black reference voltage generating circuit as taught by Hong with the display device taught by the combination of Abe et al., Yamakawa and APA in order to create a display driving apparatus and a method thereof for a wide viewing angle capable of improving the viewing angle by materializing Halftone Grayscale method by means of time division.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen G. Sherman whose telephone number is (571) 272-2941. The examiner can normally be reached on M-F, 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SS

8 May 2006

AMR A. AWAD
PRIMARY EXAMINER